



TWIN STATE ENVIRONMENTAL CORP.

P.O. Box 719, Commercial Park, 1A Huntington Road, Richmond, VT 05477

Tel.: (802) 434-3350 • Fax: (802) 434-4478 • Email: tsefs@together.net

March 17, 1997

Mr. Ron Rushford
R. L. Vallee / Ultramar
282 South Main Street
P.O. Box 711
St. Albans, VT 05478

RE: Peyratt Spill, Swanton, VT
TSEC Project # 97-008 972148

Dear Mr. Rushford:

Twin State Environmental Corporation (TSEC) has been investigating and conducting remedial activities at the Peyratt residence on 66 Sugar Maple Drive in Swanton, Vermont following a release of approximately 100 to 150 gallons of fuel oil inside the laundry room of the home. The laundry room is in the basement of the home, where a 275 gallon fuel oil tank is located. Please refer to **Figure 1** for the Site Location Plan. Following approval by R.L. Vallee/Ultramar, TSEC conducted a subsurface investigation to attempt to define the horizontal extent of contamination inside and outside of the home. The results of the investigation were presented to you in a letter dated February 12, 1997, **Attachment No. 1**.

The letter also recommended the installation of a soil vapor extraction (SVE) system designed to remove petroleum vapors from beneath the slab in the laundry/utility room. The results of the SVE operation and recommendations for additional work are presented below.

1.0 Remedial Activities

The installation of the SVE system was performed on February 18 and 19, 1997. The SVE unit consists of a 1.0 horsepower regenerative blower plumbed to a manifold which controls flow rates and vacuum to the three (3) vapor extraction lines (SV-1, SV-2, and SV-3). Each extraction line was installed to pull vapors from two (2) different vent wells. A moisture separator was added to the system to capture any water that might be drawn from the vent wells. A schematic of the system is presented in **Figure 2**.

A series of SITE visits have been performed since the installation to monitor the system parameters and make adjustments if necessary. A summary of the SITE visits is presented in **Table 1**.

TABLE 1
SITE Visit Summary

Date	Description
02/18/97	Initial installation of system.
02/19/97	Finish system installation. Start pilot test to determine operating parameters.
02/20/97	Measure operating parameters. Made adjustments to increase flow to SV-2 and SV-3. Turned off SV-1 since PID concentrations were less than detection limit. Collected vapor sample from system effluent for laboratory analysis.
02/21/97	Measure operating parameters. Increased vacuum to SVE lines. Water pulled into vent lines. Reset operating parameters.
02/24/97	Measure operating procedures. increased vacuum to SVE lines. Water pulled into vent lines. Rest operating parameters
02/28/97	Measure operating parameters.
03/05/97	Measure operating parameters. Located outside end of basement floor drain. Drain water had a sheen and a fuel oil odor.
03/07/97	Measure system parameters. Place absorbant sock in outfall of floor drain. Evaluated areas for additional vent well placement.
03/12/97	Measure system parameters. Checked absorbant sock. Collected soil sample at outfall of floor drain. Collected water sample from water supply. Submitted samples for laboratory analysis.

Note: operating paramters include measuring vapor concentrations with a Photoionization Detector (PID) throughout the house and within the SVE system, measuring vacuum and air flow within the SVE system, and checking for water build-up in the vent wells.

2.0 Results

PID concentrations taken since the installation of the SVE are presented in **Table 2** and graphically presented in **Figure 4**.. The concentrations show a continuous decline during the operation of the SVE system. However, the area of highest concetration remains in the middle of the laundry room under the slab.

Although the vapor concentrations under the slab in the laundry/utility room are elevated above normal, the SVE system has not recovered a significant amount of fuel oil in terms of gallons recovered, refer to **Table 2**. The extraction of vapors from the existing system is limited, in part, due to the fact that the water table beneath the floor is almost to the bottom of the slab. The negative pressure applied by the SVE raises the water table thus reducing the ability to remove vapors. The monitoring of free product in the vent points has not shown any accumulation of product. Concentrations along the backside of the home in points SB-1 and SB-4 dropped rapidly below detectable levels folowing startup of the SVE system. The water quality results of the supply well did not show any compounds above method detection limits for the compounds tested. A copy of the analytical report is located in **Appendix A**.

Following a recent thaw TSEC was able to locate the outfall of the footing drain. There was a minor sheen observed, however it did not appear that a significant volume of fuel had migrated to this location.

Mr. Ron Rushford
March 17, 1997

Our initial subsurface investigation did not address the area under the living/rec. room due to the fact that significant contamination was identified in the laundry and we did not want to conduct intrusive activities (drilling and coring) in the finished areas unless necessary.

3.0 Recommendations

Based on the data and information presented above, we offer the following recommendations:

- excavate by hand at the southwest corner of the home and tie into the existing footing drain to monitor the drain and determine if any product has accumulated in the front side of the home.
- collect an additional sample of the water supply well, because bedrock is in contact with the foundation and is susceptible to contamination.
- expand the investigation into the living/rec. room of the home. Most recent monitoring data from the system indicates that the contaminant levels are predominantly located under the foundation slab and not outside the home. This will include installing vapor points similar to those installed in the laundry room.
- Continue to operate and monitor the SVE system and expand the venting to include the newly proposed vapor points if necessary.
- Monitor the outlet of the footing drain for the presence of petroleum contamination.

We also are recommending that some of the porous materials in the home be either sealed or removed and replaced. These materials include styrofoam insulation, wood framing around the downstairs bathroom and sealing of concrete that has been stained with fuel oil. These efforts will help reduce odors inside the home in the future.

If we are able to locate additional areas of petroleum contamination, it is likely that we will expand the SVE system to include these areas. If you have any questions or require any additional information, please do not hesitate to contact our office.

Sincerely,
TWIN STATE ENVIRONMENTAL CORPORATION

COPY

John R. Diego
Project Manager

TABLES

TABLE 2
AIR QUALITY MONITORING

Peyratt Spill
TSEC Project No. 97-008

Date	02/19/97	02/20/97	02/21/97	02/24/97	02/28/97	03/04/97	03/07/97	03/12/97										
Time	1000	1300	1210	1030	1015	1230	1130	1010										
	Concentration, ppmv																	
SV-1	nt	1.0	nt	nt	nt	nt	nt	nt										
SV-2	nt	27	8.1	9.9	6.9	5.3	5.3	5.7										
SV-3	375	228	155	61	30	50	43	27										
SB-101	380	153	48	15	14	9.5	5.3	8.0										
SB-102	425	324	205	113	34	77	60	47										
SB-103	nt	87	39	40	32	18	9.5	17										
SB-105	nt	6.7	5.0	4.7	1.8	3.1	3.1	3.4										
SV-Inf	nt	38	nt	22	9.2	7.4	7.4	8.0										
SV-Eff	3.3	28	11	9.5	3.8	5.3	3.1	3.4										
	Flow, cfm																	
SV-1	18	nt	nt	nt	nt	nt	nt	nt										
SV-2	28	23	17	14	5	8	9	8										
SV-3	12	36	8	10	4	9	6	9										
SB-101	7	23	5	6	7	5	4	5										
SB-102	5	16	3	5	10	4	4	4										
SB-103	12	12	6	3	2	7	4	2										
SB-105	18	13	9	13	5	9	6	4										
SV-Inf	60	69	36	14	35	23	23	23										
SV-Eff	113	104	104	115	113	113	113	108										
VES Removal Rate, lbs/day	0.12	0.94	0.37	0.35	0.14	0.19	0.11	0.12										
Total to Date, lbs	0.12	0.65	1.30	2.40	3.40	4.10	4.55	5.10										
VES Removal Rate, gal/day	0.014	0.110	0.044	0.043	0.017	0.022	0.013	0.014										
Total to Date, gal	0.010	0.14	0.22	0.35	0.46	0.54	0.59	0.66										
	Vacuum, in. H ₂ O																	
SV-1	6.0	nt	nt	nt	nt	nt	nt	nt										
SV-2	6.0	6.0	5.0	5.0	6.0	6.0	5.5	5.0										
SV-3	5.8	9.0	5.0	5.0	6.0	5.8	5.5	5.0										
SB-101	5.0	8.5	5.0	5.0	7.0	5.0	5.0	5.0										
SB-102	5.0	8.5	4.5	5.0	7.0	5.5	5.0	5.0										
SB-103	6.0	6.0	4.8	5.0	7.0	5.0	5.0	5.0										
SB-105	6.0	6.0	4.5	4.8	7.0	5.5	5.0	5.0										
SV-Inf	nt	11.0	4.5	5.6	7.0	5.5	5.0	5.5										
SV-Eff	nt	nt	nt	nt	nt	nt	nt	nt										

NOTES:

1. ppmv - parts-per-million volume.
2. Volatile organic compounds measured with a Thermo Environmental Instruments Model 580B photoionization detector (PID) with a 10.6 eV lamp. The instrument was calibrated with an isobutylene standard.
3. Removal rate in gal/day is based on a specific gravity of fuel oil of 0.85 and density of ~7.1 lb/gal.
4. Total lbs/day and gal/day were calculated by averaging removal rates between sampling periods.
5. nt - measurement not taken.
6. Concentration of 0.0 used for graphical purposes. Actual instrument reading was <0.1.

TABLE 3

Vapor Extraction System Worksheet
Peyratt Spill Swanton, Vermont
TSEC Project No. 97-008

PID Readings (ppmv)

Date

	02/19/97	02/20/97	02/21/97	02/24/97	02/28/97	03/04/97	03/07/97	03/12/97		
Monitoring Location										
Kitchen	0.7	0.9	<1.0	1.3	0.7	1.0	1.0	0.0		
Liv. Room	0.5	0.9	<1.0	1.3	0.9	1.0	1.0	0.0		
Basement	1.1	0.9	<1.0	1.5	1	1.0	1.0	0.0		
Bathroom Closet	1.3	0.9	nt	4.6	2.3	3.1	1.0	1.1		
Utility Room	4.1	4.8	1.1	3.8	2.3	1.0	3.1	1.1		
Upstairs	0.9	0.9	<1.0	1.5	1	1.0	1.0	0.0		
Bathroom	1.3	0.9	<1.0	1.8	1.1	1.0	1.0	0.0		
Bath Cabinet	2.7	2.8	1.1	2.9	1.7	3.1	1.0	1.1		
Outside	nt	nt	nt	0.4	0	0.0	1.0	0.0		
Crawl Space	nt	nt	nt	1.6	0.8	0.0	1.0	0.0		
SB-104	nt	nt	nt	2.2	2.8	3.1	1.0	1.0		
SV-1	nt	1	nt	nt	nt	nt	nt	nt		
SV-2	nt	27	8.1	9.9	6.9	5.3	5.3	5.7		
SV-3	375	228	155	61	30	50	43	27		
SV-Eff	3.3	28	11	9.5	3.8	5.3	3.1	3.4		
SV-Inf	nt	38	25	22	9.2	7.4	7.4	8.0		
SB-101	380	153	48	15	14	9.5	5.3	8.0		
SB-102	425	324	205	113	34	77	60	47		
SB-103	nt	87	34	40	32	18	9.5	17		
SB-105	nt	6.7	5.0	4.7	1.8	3.1	3.1	3.4		

Notes:

1. PID readings were taken with a ThermoEnvironmental 580B model photoionization detector.
2. PID readings measured throughout locations in the house fluctuated between 0.0 and the value shown in the table.

TABLE 4
COST ESTIMATE Amendment No. 2

Date: March 17, 1997
 SITE Name: Peyratt Spill
 TSEC Project Manager: John Diego
 TSEC Proposal #: 97008
 SMS SITE #:
 Site Location: Swanton, VT

TASK	CONTRACTOR	DESCRIPTION	CLASS	UNITS	TYPE	RATE	ENG/HYDR	SUB EXP	LAB	OTHER	TOTALS
5.0 Indoor Air Sampling *	TSEC	NTE	D	\$1.00	NTE	\$925.00	\$925.00				
						Subtotal	\$925.00				\$925.00
6.0 Phase II investigation	TSEC	Project Manager	D	3	hr	\$70.00	\$210.00				
Drill (4) core holes in Rec. room		Technician	D	12	hr	\$40.00	\$480.00				
Tie into footing drain		Engineer I	D	12	hr	\$58.00	\$696.00				
Sample soils at outfall		Core drill	D	1	day	\$125.00	\$125.00				
Sample water supply well		Misc. fittings	R	1	est	\$500.00		\$500.00			
	Endyne	mileage	D	75	mi	\$0.50	\$37.50				
	Endyne	Water analysis	R	1	spl	\$190.00			\$190.00		
		Soils analysis	R	1	spl	\$120.00			\$120.00		
		PID Rental	D	1	day	\$75.00	\$75.00				
						Subtotal	\$1,623.50	\$500.00	\$310.00		\$2,433.50
7.0 Re-balance SVE system	TSEC	Project Manager	D	2	hr	\$70.00	\$140.00				
Perform up to six (6) site visits		Technician	D	36	hr	\$40.00	\$1,440.00				
		Engineer I	D	6	hr	\$58.00	\$348.00				
		SVE Rental	D	1	wk	\$950.00	\$950.00				
		mileage	D	430	mi	\$0.30	\$129.00				
		PID Rental	D	6	day	\$75.00	\$450.00				
						Subtotal	\$3,457.00				\$3,457.00
8.0 Status report	TSEC	Engineer I	D	12	hr	\$58.00	\$696.00				
		Project Mgr.	D	2	hr	\$70.00	\$140.00				
		Clerical	D	2	hr	\$25.00	\$50.00				
						Subtotal	\$886.00	\$0.00			\$886.00

D - Direct expense

R - Reimbursable expense

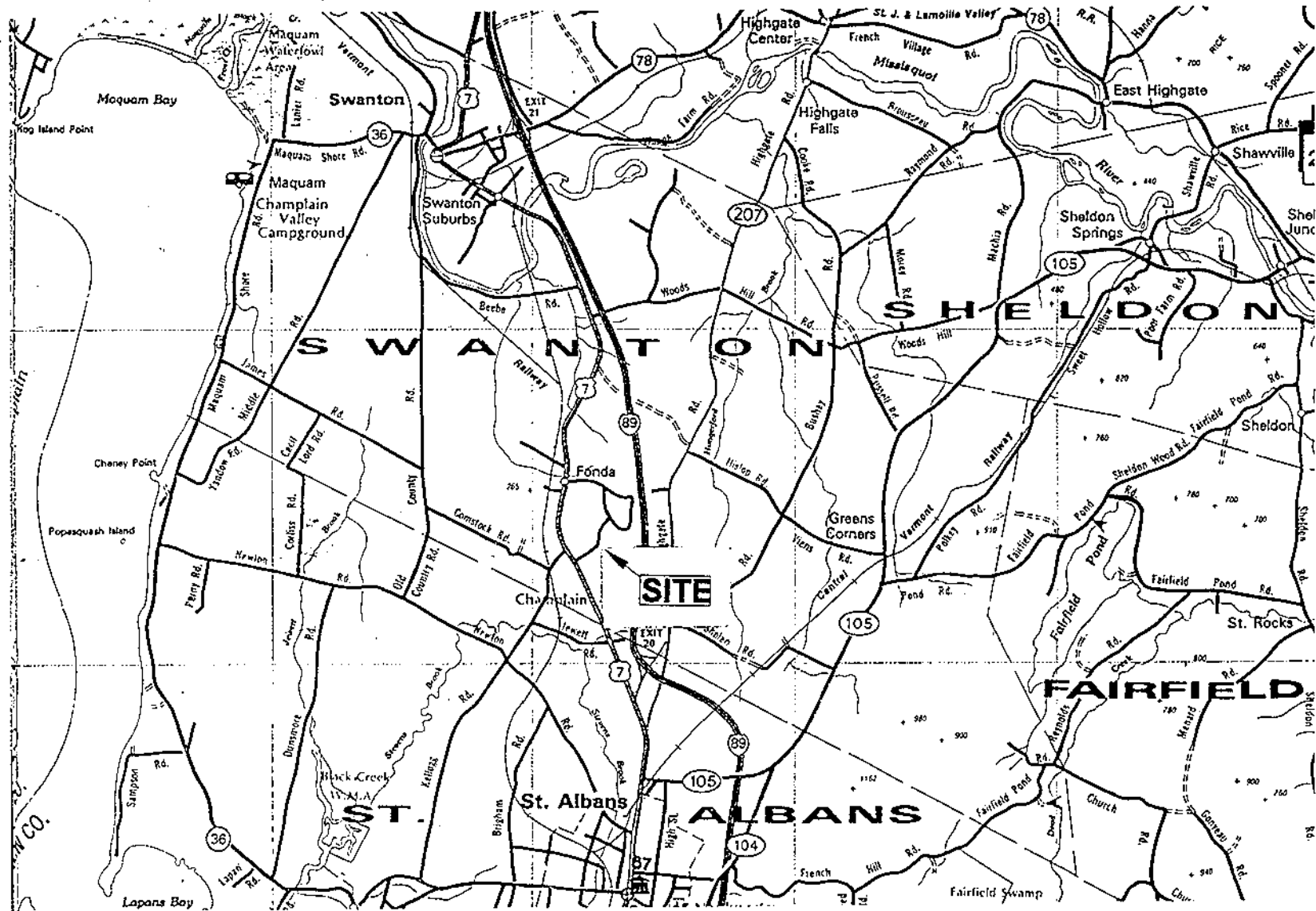
LS - Lump Sum

* - Work approved as Amendment No. 1, dated March 14, 1997

COST ESTIMATE

\$7,701.50

FIGURES



Source: Vermont Road Atlas

N

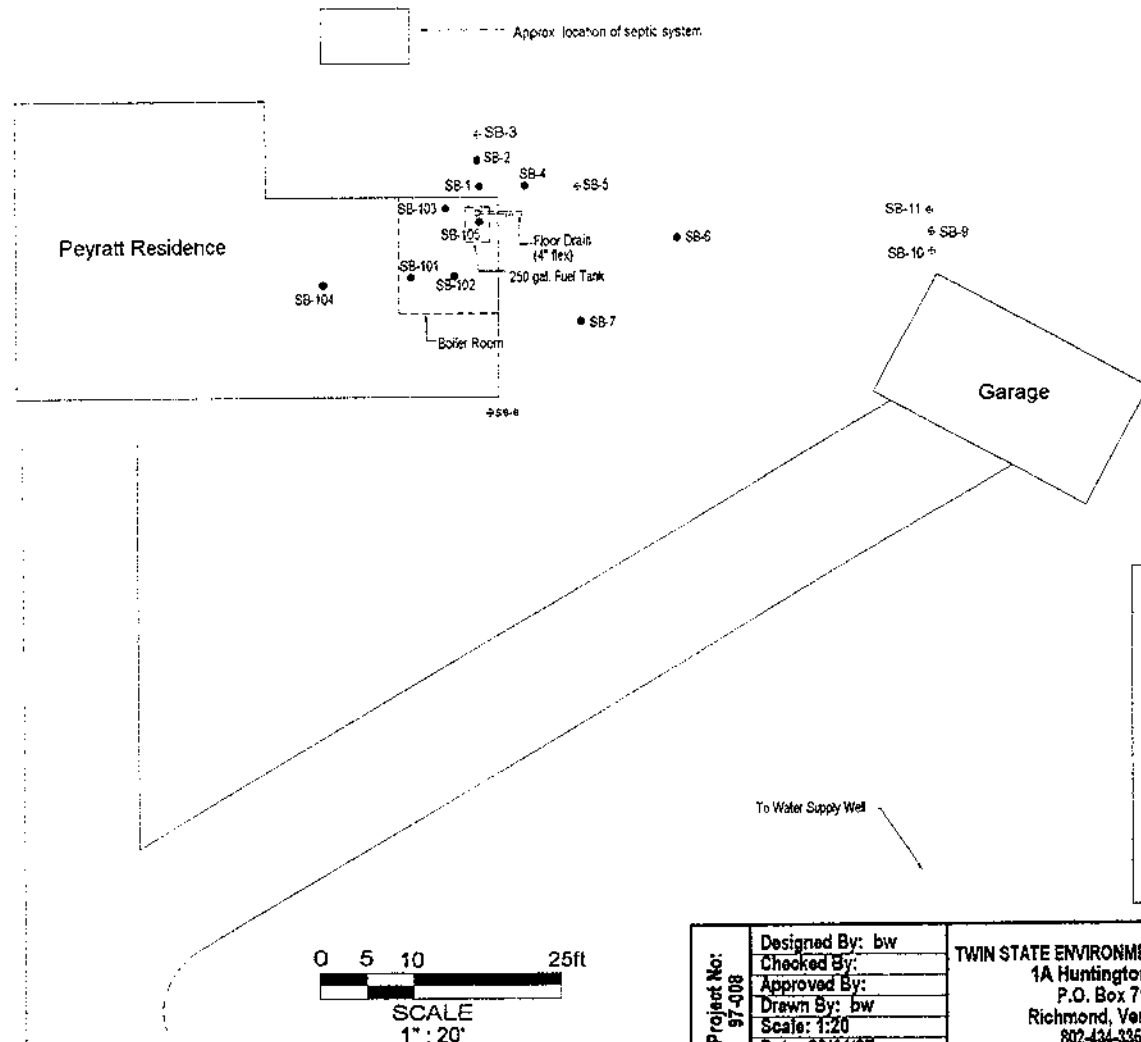
1 0 1 2 3 4 MILES

Project No:
97-008

Designed By: ljb
Checked By:
Approved By:
Drawn By: bw
Scale: 1" = 1 mile
Date: 03/17/97

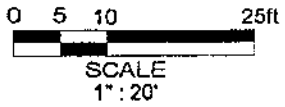
TWIN STATE ENVIRONMENTAL CORP.
1A Huntington Rd.
P.O. Box 719
Richmond, Vermont
(802) 434-3360

FIGURE 1
SITE Location Map
Peyrat Spit
Swanton, Vermont

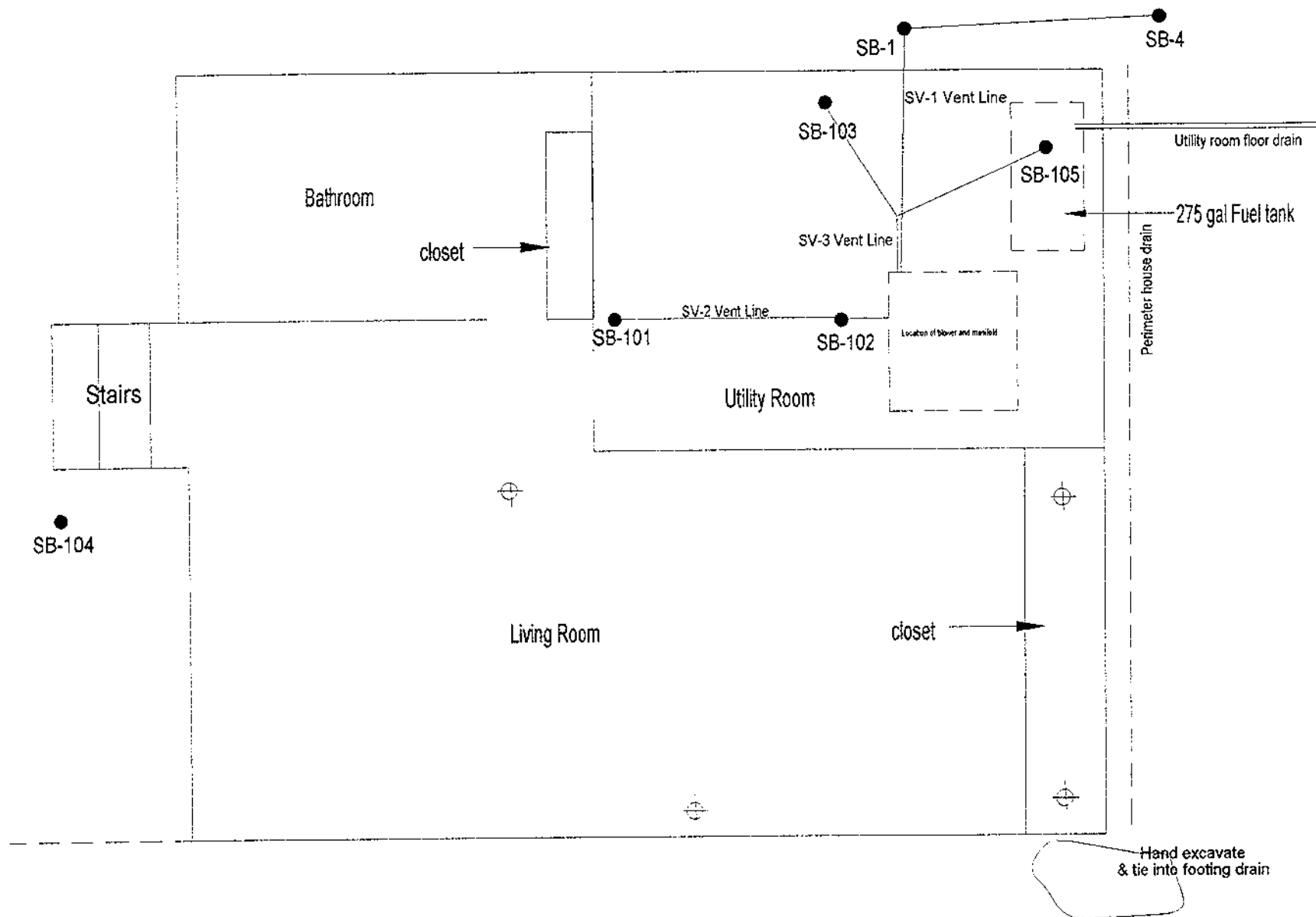


LEGEND

- ⊕ Soil Boring Location
- Soil Borings Coverted to Vapor Recovery Wells



Project No: 97-008	Designed By: bw	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont 802-434-3360	FIGURE 2 SITE PLAN Peyratt Residence February 1997 Swanton, Vermont
	Checked By:		
	Approved By:		
	Drawn By: bw		
	Scale: 1:20		
	Date: 02/11/97		



⊕ Proposed well/vent location

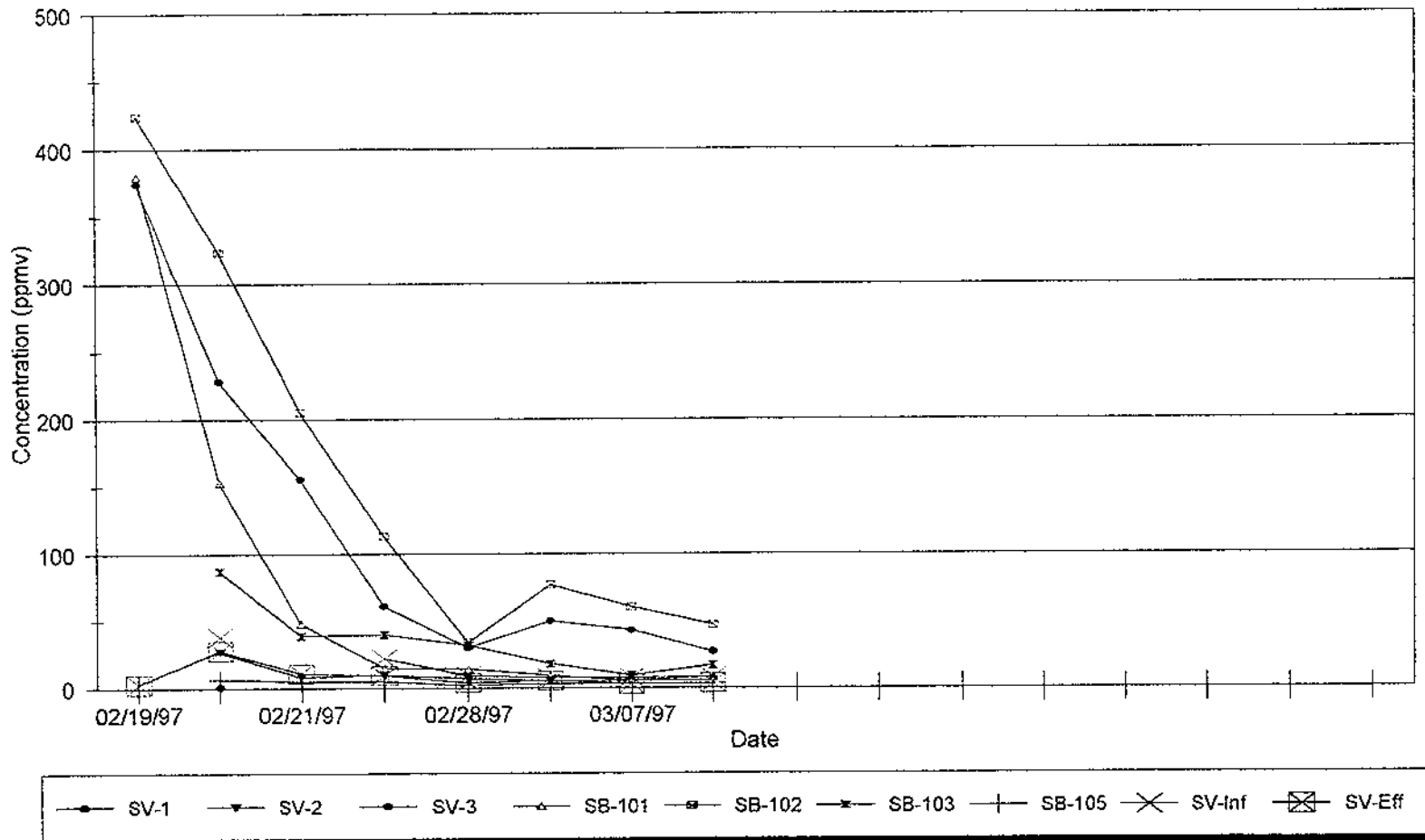
Project No.: 97-408	Designed By: bw
	Checked By:
	Approved By:
	Drawn By: bw
	Scale: not to scale
Date: 03/06/97	

TWIN STATE ENVIRONMENTAL CORP.
1A Huntington Rd.
P.O. Box 719
Richmond, Vermont
802-434-3350

FIGURE 3
VES Plan

Peyratt Spill
Swanton, Vermont

FIGURE 4
Soil Venting Trend Analysis-p1.



ATTACHMENT 1



TWIN STATE ENVIRONMENTAL CORP.

P.O. Box 719, Commercial Park, 1A Huntington Road, Richmond, VT 05477

Tel.: (802) 434-3350 • Fax (802) 434-4478

February 12, 1997

Mr. Ron Rushford
R.L. Vallee/Ultramar
282 South Main Street
St. Albans, VT 05478

RE: Peyratt Fuel Oil Spill
TSEC Project No.: 97008

Dear Mr. Rushford:

The purpose of this letter is to update you on the status of our investigation delineating the extent and degree of fuel oil contamination at the Peyratt residence on 66 Sugar Maple Drive in Swanton, VT. Please refer to Figure 1 for the Site Location Plan. Twin State Environmental Corporation (TSEC) was notified of a release of approximately 100 to 150 gallons of fuel oil inside the laundry room of the home. The laundry room is in the basement of the home, where a 275 gallon fuel oil tank is located. Following approval by you, TSEC conducted a subsurface investigation to attempt to define the horizontal extent of contamination inside and outside of the home. The results of the investigation are presented herein.

On Tuesday February 4, 1997 TSEC advanced four boreholes inside the lower level of the home near the oil tank. Three of the boreholes were located in the laundry room and one was in the crawl space near the center of the home. Please refer to Figure 2 for approximate locations. Additionally eleven borings were advanced outside of the home at locations shown on Figure 2. Headspace analysis was performed on soils retrieved from the boreholes and screened with a Thermo Instruments Model 580 B photoionization detector (PID) for the presence of volatile organics.

One inch diameter PVC well/vents were installed in nine of the fifteen boreholes. PID measurements were also collected from the newly installed vapor points. Results of the PID measurements are summarized on Table 1.

The soil boring study indicates that the depth to bedrock is very shallow. The footings of the home appear to be installed on top of bedrock, at least in the laundry room. Soil borings inside the basement encountered crushed stone below the slab. Bedrock was encountered between 4 and 12 inches below the bottom of the slab. Petroleum vapors were observed in three of the four boreholes.

Eleven boreholes were advanced outside the home to delineate the extent of contamination. Ten of the boreholes were advanced to refusal on bedrock. One borehole met refusal at about 8

•Mr. Ron Rushford
February 12, 1997

inches and was terminated due to the suspicion of the septic tank in that location. The depth to bedrock was approximately 5 to 8 feet below ground surface (bgs). These elevations of bedrock are consistent with the bedrock elevations encountered inside the home.

TSEC returned to the site on Wednesday, February 5, 1997 to complete the assessment and attempted to remove any recoverable product. A sump drain was located inside the basement underneath the oil tank that extended through the frost wall. The line was excavated outside the home by hand and it was determined this line was connected to a footing drain around the perimeter of the home. The sump discharge drain line runs to the west side of the property and reportedly daylights near the garden area but attempts to locate the end of the line were unsuccessful due to the snow and ice cover.

Recoverable product was not found inside the drain line or beneath the drain and sump lines. Approximately 100 feet of vacuum line connected to a drum vac was inserted into the drain line but no product was found.

The soils above the bedrock do not appear to be contaminated due to the fact that the release occurred in the basement and drained into the sump that is directly in contact with the bedrock. The apparent groundwater elevation is currently below the invert of the drain line at the corner of the house. According to the home owner, the drain does flow in the spring time.

The water supply well is located several hundred feet west of the home. The water level in the well is greater than 100 feet from ground surface indicating a downward vertical flow component. Based on these conditions, the bedrock aquifer may be at risk from this release. A sample from the water supply has been collected and submitted to the laboratory for analysis by EPA Method 524.

Considering the extent of contamination, the lack of soil contamination and thin overburden aquifer TSEC recommends active venting of the subsurface with the use of a soil vapor extraction (SVE) unit. This method is non-intrusive and would involve connecting one or more of the existing vapor points to the SVE unit and operating the unit until appropriate levels are achieved or until the operation is no longer feasible. There will be additional power consumption to operate the system. Off gas treatment is probably not necessary.

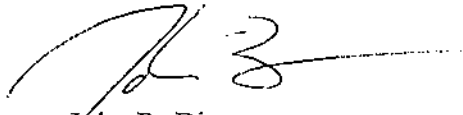
Presented on Table 2 is the cost estimate to install and operate the SVE system. It will be important to install the system soon. Warmer seasonal temperatures will likely result in a rise in the water table which will act as a transport mechanism for the further migration of contaminants.

We anticipate operating the system for approximately one (1) month. Following one month of operation we will submit a report recommending to either shut the system down or continue operating.

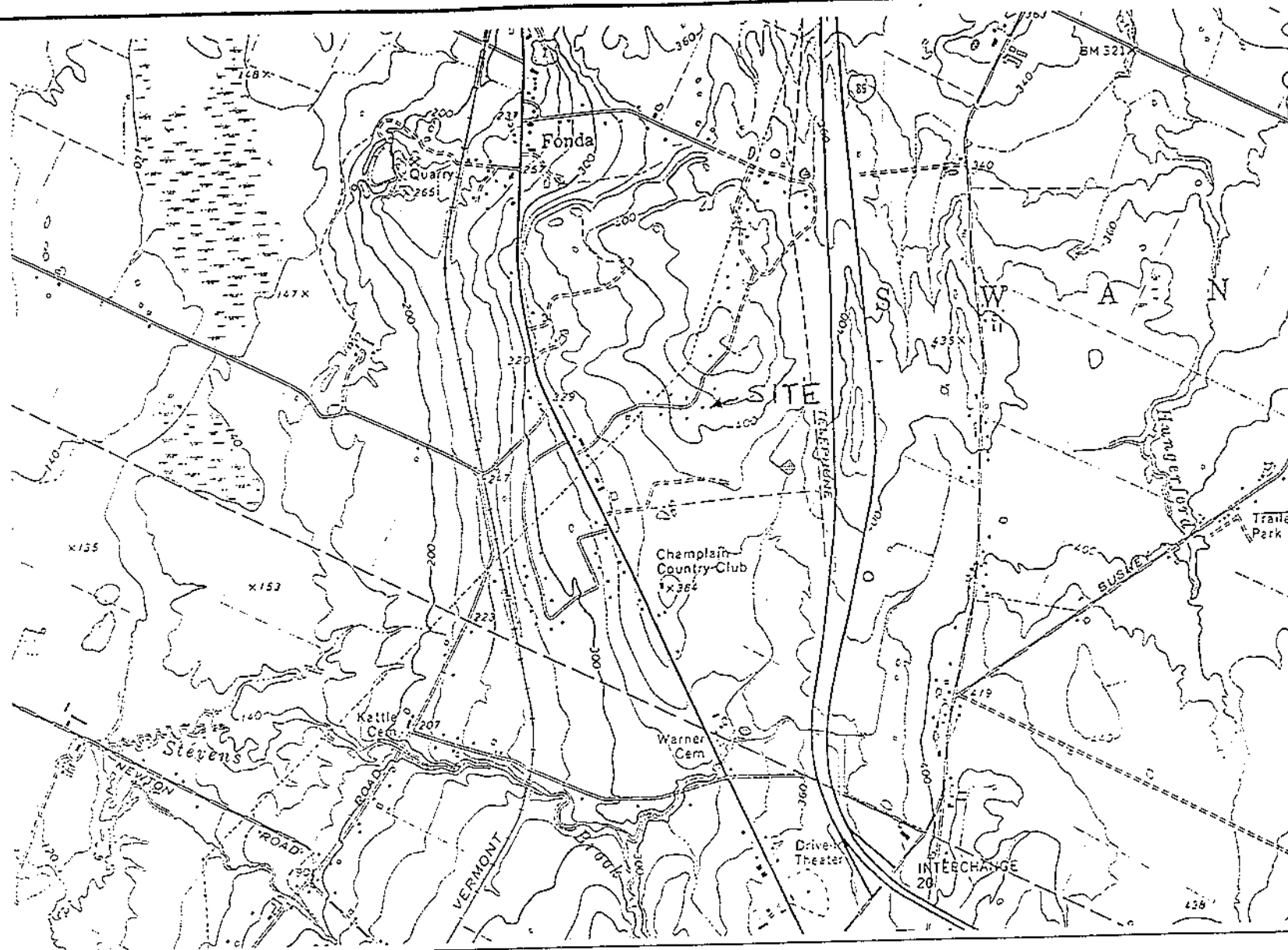
Mr. Ron Rushford
February 12, 1997

Please contact me with any questions you may have.

Sincerely,
TWIN STATE ENVIRONMENTAL CORPORATION



John R. Diego
Vice President



Project No: 97008	Designed By: <u>LD</u>	TWIN STATE ENVIRONMENTAL CORP. 1A Huntington Rd. P.O. Box 719 Richmond, Vermont (802) 434-3350	FIGURE 1 SITE LOCATION MAP Peyratt Residence Swanton, Vermont
	Checked By: _____		
	Approved By: _____		
	Drawn By: _____		
	Scale: as shown		
	Date: 05/95		

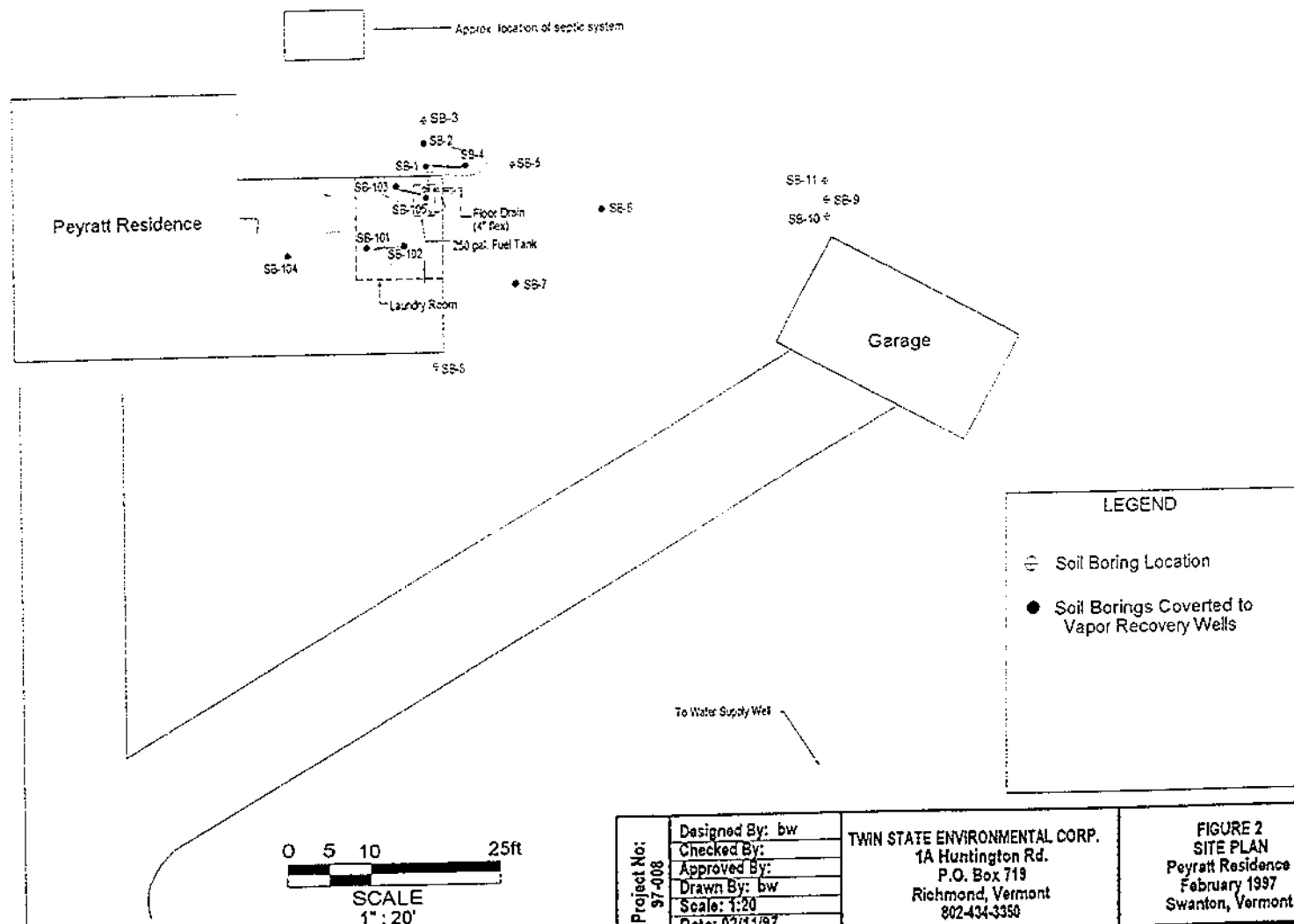
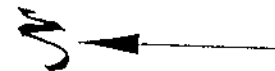


TABLE 1

SUMMARY OF INDOOR AIR QUALITY

Peyratt's Residence
Swanton, Vermont

Date	2/5/97	2/5/97	2/5/97	2/6/97	2/7/97
Time	10:30	11:10	15:00	10:00	10:00

Boiler room vents					
SB-101	nt	240	nt	343	557
SB-102	66	235	347	551	675
SB-103	137	135	nt	311	339
SB-104	nt	nt	nt	<1	<1
SB-105	nt	nt	nt	nt	80

Living Areas					
garage	nt	nt	nt	<1	nt
entranceway	nt	nt	nt	1.1	nt
living room	nt	nt	nt	2.0	0.1
dining room	nt	nt	nt	1.7	nt
top stairs	nt	nt	nt	2.2	0.1
bottom stairs	nt	nt	nt	2.2	0.1
boiler room	nt	nt	nt	8.0	2.0
floor drain	nt	nt	nt	21.0	nt

* notes

nt - not tested

laundry room ventilated after 2/6/97

PID readings in ppmv